REMARKS/ARGUMENTS

Claims 1, 3, 5, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thorner et al. (US Patent No. 6,422,941) in view of the linear congruential method of generating pseudo-random numbers.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thorner and the linear congruential random number generator in view of Simonelli (US Patent No. 4,817,948).

I. THE PRESENT INVENTION

As previously discussed, embodiments of the present invention are directed towards increasing realism of a driving simulation. In particular, an introduced feature is the inclusion of "random" force to gear lever vibrations for the player to experience, while the player is "driving" the vehicle. P.18,l.13-21. As described in the specification, the repulsive force is modified by a "heightening or lowering" factor, that is determined with use of a random number. P.18,l.22-25.

Claim 1, as amended, recites: wherein, the generation unit generates a random number and designates as the instruction information, a value obtained by heightening or lowering the repulsive force specified by the acquired repulsive force information with the generated random number, at every predefined interval.

II. THORNER

Previously discussed, Thorner, fails to disclose modifying a CRASH HOLD and/or CRASH FADEOUT factors with a random modifier. Thorner merely discloses that the CRASH HOLD time specifically specifies the duration for the CRASH MAGNITUDE and the CRASH FADEOUT is for post-crash motions. Specifically, Thorner states:

> The tactile feedback resulting from this "crash" response is then controlled by the last two parameters in step 1292 and 1294, CRASH HOLD and CRASH

> FADEOUT. … This highest possible value is maintained within the appropriate calculated audio result for the time specified in the CRASH HOLD parameter, e.g., 0.25 sec. After the CRASH HOLD time expires, the CRASH FADEOUT parameter specifies the time, e.g., 0.1 sec., that it will take to decay this highest possible output down to zero. This step allows "crash" tactile feedback responses to range from hard hitting, instantly decaying jolts, to instantly peaking and slowly decaying waves. Col.l6.26-58. Emphasis added.

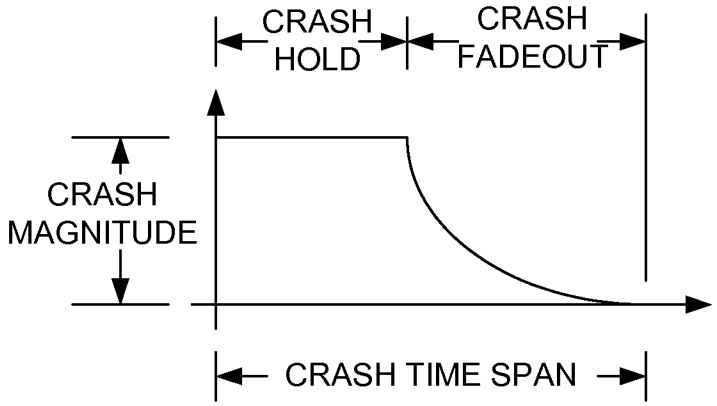
As can be seen, Thorner allows the game designer to specify how severe a crash will be output to the player, by allowing the game designer to specify the values of CRASH HOLD, e.g. 0.25 sec. and CRASH FADEOUT, e.g. 0.1 sec.

Thorner states that the above parameters must be explicitly set, otherwise, the player may not have sufficient force feedback to simulate the event. Specifically Thorner states:

> In games or simulations, any number of generally traumatic events can occur that will require a very powerful response by the tactile feedback controller 110 when it is operating in its host-independent audio analysis mode. … These types of simulated events, and others like them, are typically accompanied by an abrupt and varied rise in the amplitude of some appropriately provided sound effect (hereafter referred to as a "crash" event). However, this rise in audio amplitude may not inherently have enough power, and/or may not last long enough, to cause a powerfully appropriate tactile feedback event to match the simulated event.
>
> In order to rectify this shortcoming, in steps 1280 and 1290 the next two parameters, CRASH MAGNITUDE and CRASH TIME SPAN, together allow the combined magnitude and time span of an abrupt rise in the digitally sampled audio to generate a "crash" response. The tactile feedback resulting from this "crash" response is then controlled by the last two parameters in step 1292 and 1294, CRASH HOLD and CRASH FADEOUT. … In this manner, strong tactile feedback responses can be shaped as desired, and will be divorced entirely from the inherent strength and duration of the original "crash" sound event. Col.16.l.3-63. Emphasis added.

As can be seen, according to Thorner, CRASH HOLD and CRASH FADEOUT need to be specifically determined values, otherwise the player may not be provided with the desired tactile feedback.

The Examiner incorrectly assets that the repulsive force of the CRASH MAGNITUDE is modified in a cycle based upon the CRASH HOLD and CRASH FADEOUT values. P.3, ¶1. The Examiner misuses the word "modified" in that sentence as a basis for the rejection. It is respectfully asserted that that CRASH HOLD merely refers to the duration for applying the CRASH MAGNITUDE signal, and that CRASH FADEOUT refers to the duration for the fading-out of the CRASH MAGNITUDE signal. For example, it is asserted that this is the proper usage of these terms in Thorner.



Accordingly, as can be seen neither CRASH HOLD nor CRASH FADEOUT modify (raise or lower) the intensity or magnitude of the CRASH MAGNITUDE output, as was asserted by the Examiner.

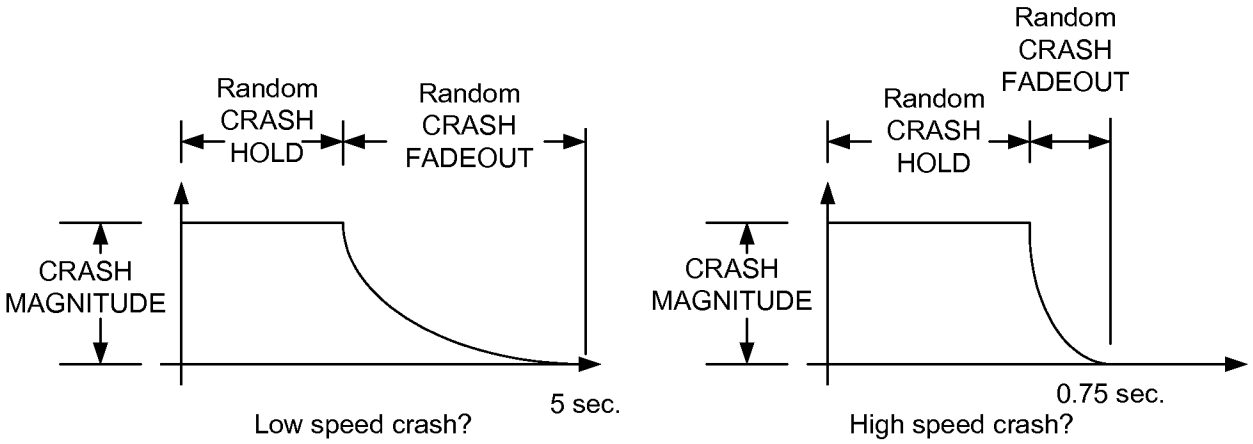
III. THORNER DISTINGUISHED

A. Claim 1

Claim 1 is not disclosed, taught, or suggested in view of Thorner to one of ordinary skill in the art. More specifically, Thorner fails to disclose the limitation of: wherein, the generation unit generates a random number and designates as the instruction information, a

value obtained by heightening or lowering the repulsive force specified by the acquired repulsive force information with the generated random number, at every predefined interval.

The undersigned traverses the Examiner's assertion that it would have been obvious to set values for CRASH HOLD and CRASH FADEOUT randomly. Office Action, p.6, P5. As discussed in Thorner, these two parameters provide the tactile feedback to the user for the "crash response." If, as the Examiner asserts, these values were randomly set, there would be significant problems with Thorner's system. One problem would be that random values for these parameters would not be in anyway proportional to the crash event. For example, crashing a wall at a low speed may have CRASH HOLD and CRASH FADEOUT times, such as 2.0 sec. and 3.0 sec., respectively, whereas, crashing a wall at a high speed may have respective random times, such as 0.5 sec. and 0.25 sec. Of course, this would not make sense to a player who would expect a crash at a high speed to linger longer than a crash at low speed. Accordingly, one of ordinary skill in the art would not even have considered using random numbers for such parameters:



Secondly, as Thorner cautioned, the system must be "long enough, to cause a powerfully appropriate tactile feedback." Accordingly, using random numbers for such parameters would not guarantee the "appropriate tactile feedback." Accordingly, Thorner explicitly teaches away from using random numbers for determining CRASH HOLD and a CRASH FADEOUT values.

The undersigned also traverses the Examiner's assertion that it would have been obvious to use a "linear congruential method to cyclically generate random numbers." Office action, p.4,l¶2-3. This assertion is traversed for the reasons noted above. Further, this assertion is traversed because "linear congruential method" is simply a description of typical pseudo-random number generator methods. Such methods for generation numbers has been well known in the art and are typically characterized by having a repeating cycle of numbers.

In contrast, as now recited in claim 1, the generation unit generates a random number at every predefined interval (p.18,l.13-21), which is typically a video synchronization signal (p.13,l.25-27 and Fig. 4). In various embodiments, because the generated random numbers are determined at intervals, the frequency distribution should appear in the frequency domain as white noise. Accordingly, players of the game, or the like should not be able discern a repeating cycle of numbers, because the randomness of "the random number." The linear congruential method described by the Examiner, however, is characterized by a repeating cycle of numbers, accordingly does not correspond to a "random number," as recited in the claims.

As an example of the above, in various embodiments, a cycle of a typical n-bit random number generated by a typical random number generator is, "rand()" is 2^n-1 or so. In various implementations with a 16 bit or a 32 bit computation, such a cycle is approximately 32,768 or 2,147,483,648. Since a video sync signal is every 1/30 or 1/60 sec, the cycle of a repulsive force is calculated to be about 9 minutes (32,768/60 seconds). In various embodiments, if the repulsive force is such a long time cycle, the player would not typically be able to sense the cyclical nature of the noise. Accordingly, various embodiments describe a "random number" as having a sufficiently long cycle to thereby make the player unaware of the cycle. This is not disclosed, suggested, or implied by Thorner, to one of ordinary skill in the art.

In light of at least the above, Claim 1 is not obvious in light of Thorner.

B. Remaining claims

Independent claims 6 and 8, as amended, are also asserted to be allowable, for substantially the same reasons as claim 1, and more specifically, for the specific limitations they recite.

Claims 3-5, dependent upon claim 1, are also asserted to be allowable, for substantially the same reasons as claim 1, and more specifically, for the specific limitations they recite

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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